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Patent Docket Administrator BorgWarner Inc. 3800 AUTOMATION AVENUE SUITE 100 AUBURN HILLS, MI 48326			BELENA, JOHN F	
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*13*

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/021,566	<b>Applicant(s)</b> HUNTER ET AL.
	<b>Examiner</b> John F. Belena, Ph.D.	<b>Art Unit</b> 3746

*[Handwritten signature]*  
13

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 September 2003.
- 2a) ☒ This action is **FINAL**.      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-97 is/are pending in the application.
- 4a) Of the above claim(s) 5 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28,29 and 43-61 is/are allowed.
- 6) ☒ Claim(s) 1-4,6-27,30,32,62-66,69,70,75 and 87-97 is/are rejected.
- 7) ☒ Claim(s) 13,14,17,20,21,23-26,34-42,71-74,77,79-86,89-93 and 95-97 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                        |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____   |



*United States Patent & Trademark Office*

**DETAILED ACTION**

*Response to Amendment*

1. This Office Action is in response to applicant's amendment filed on 09/15/03. As directed by the amendment **claim 5** is cancelled, **new claims 33-97** were added and **claims 1-4, 6, 8-10, 15, 20-24 & 27-32** were amended. **Claims 1-4 & 6-97** are pending in the application.

*Drawings*

2. The drawings with drawing changes for Figures 2 & 5 were received on 09/15/03. These drawings are approved.
3. The replacement formal drawings were received on 09/15/03. These drawings are approved.

### *Specification*

4. The disclosure is objected to because of the following minor informalities: on **page 7**, line 16, the partial recitation “and reduces leakage between the containment ring or eccentric ring 20 and housing 22” should be deleted because the seal is not along any fluid path between the eccentric and the interior of the housing and on page 8 lines 13-16 clearly describe the function of the seal, on **page 16**, lines 8 & 12, “138” should read --139--.

Appropriate correction is required.

5. The substitute specification filed on 02/13/03 has not been entered because of the changes required as addressed in paragraph 2 above.

### *Claim Objections*

6. **Claims 40 & 80** is objected to because of the following informality: line 3, “the the” should read --the--. Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

7. **Claims 1-27, 30, 32 & 87-97** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter that was not described in the specification in such a way as to reasonably

convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The use of the recitations "first *feedback* signal" and "second *feedback* signal" constitute new matter per delegating authority. The term "feedback" is not found in the specification. The specification uses the following terminology in addressing the signal(s): "fluid" and "pressure".

8. **Claim 94** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 94, line 12, the partial recitation "at a first end to the flow control valve" should recite --at a first spring end to a spool of the flow control valve--.

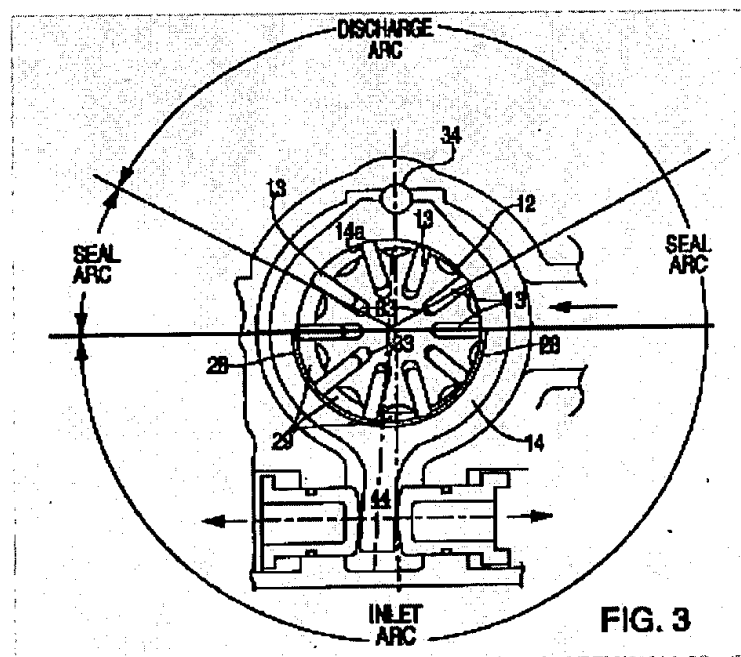
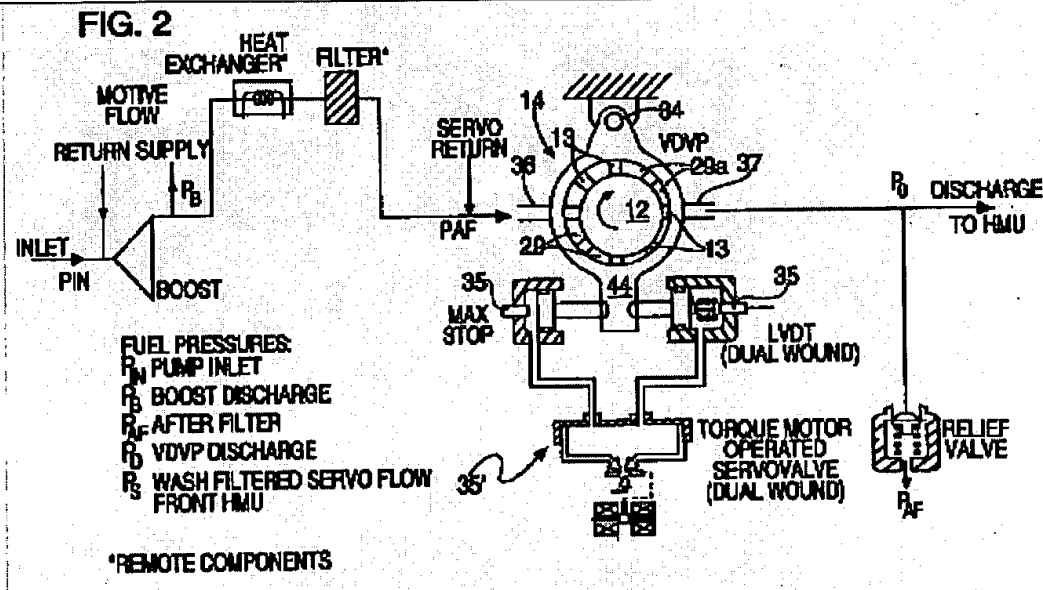
### ***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. **Claims 62-66, 70 & 75** are rejected under 35 U.S.C. 102(b) as being anticipated by (5,545,014) to Sundberg et al.

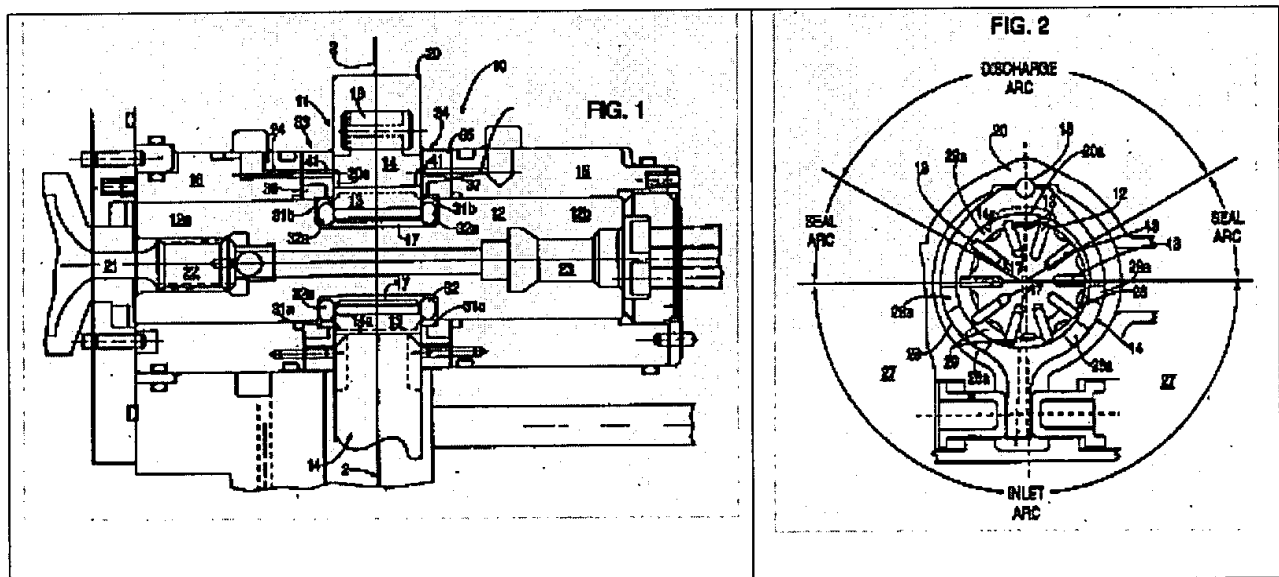


Sundberg et al., Figures 1-8, in particular Figures 2 & 3 displayed above disclose a variable displacement vane pump (11), comprising: a housing {(19), (20)} defining a

chamber, a pump inlet (36) through which fluid enters the housing {(19), (20)} and a pump outlet (25) through which fluid is discharged from the housing (19) under pressure; a containment ring or eccentric ring (14) pivotally (34) carried by the housing (20) for movement between a first position and a second position and defining an opening {not reference signed} with an internal surface (14a); a rotor (12) carried by the housing {(19), (20)} for rotation relative to the internal surface (14a) and to having a plurality of slots {(31), (33)} extending inwardly into the rotor (12) from an exterior of the rotor; a plurality of vanes (13) carried by the rotor with each vane slidably received in a slot {(31), (33)} in the rotor (12); a first actuator {See Figs. 2 & 3 right-hand piston touching (44)} responsive to application of fluid under pressure in a first actuation pressure signal and operable to pivot the containment ring or eccentric ring (14) in a first direction; and a second actuator {See Figs. 2 & 3 left-hand piston touching (44)} responsive to application of fluid under pressure in a second actuation pressure signal and operable to pivot the containment ring or eccentric ring (14) in a second direction. The first actuator {See Figs. 2 & 3 right-hand piston touching (44)} is a piston slidably carried by the body (20) and responsive to a first actuation pressure signal and the said second direction {See Figs. 2 & 3 at (44)} is in a direction opposite of the first direction. The first actuator {See Figs. 2 & 3 right-hand piston touching (44)} includes a spring {not reference signed} that in yielding biases the containment ring or eccentric ring (14) in said first direction. The pump (11) comprises a pivot pin (34) about which the containment ring or eccentric ring (14) pivots, said pivot pin (34) defining a pivot axis of

the containment ring or eccentric ring (14) which is offset from the axis of the rotor by about one-half the maximum eccentricity of the containment ring or eccentric ring (14) relative to the rotor (12). The slots (33) in the rotor (12) extend radially inwardly on the rotor (12). The said first and second actuators are fluid acting directly (44) on said containment ring (14). See Sundberg et al., Figures 1-8, and respective portions, abstract, col. 5 lines 10-67, col. 6 lines 1-67, col. 7 lines 1-67, col. 8 lines 1-62, of the detailed description.

11. Claims 62-65, 70 & 75 are rejected under 35 U.S.C. 102(b) as being anticipated by (5,545,018) to Sundberg.

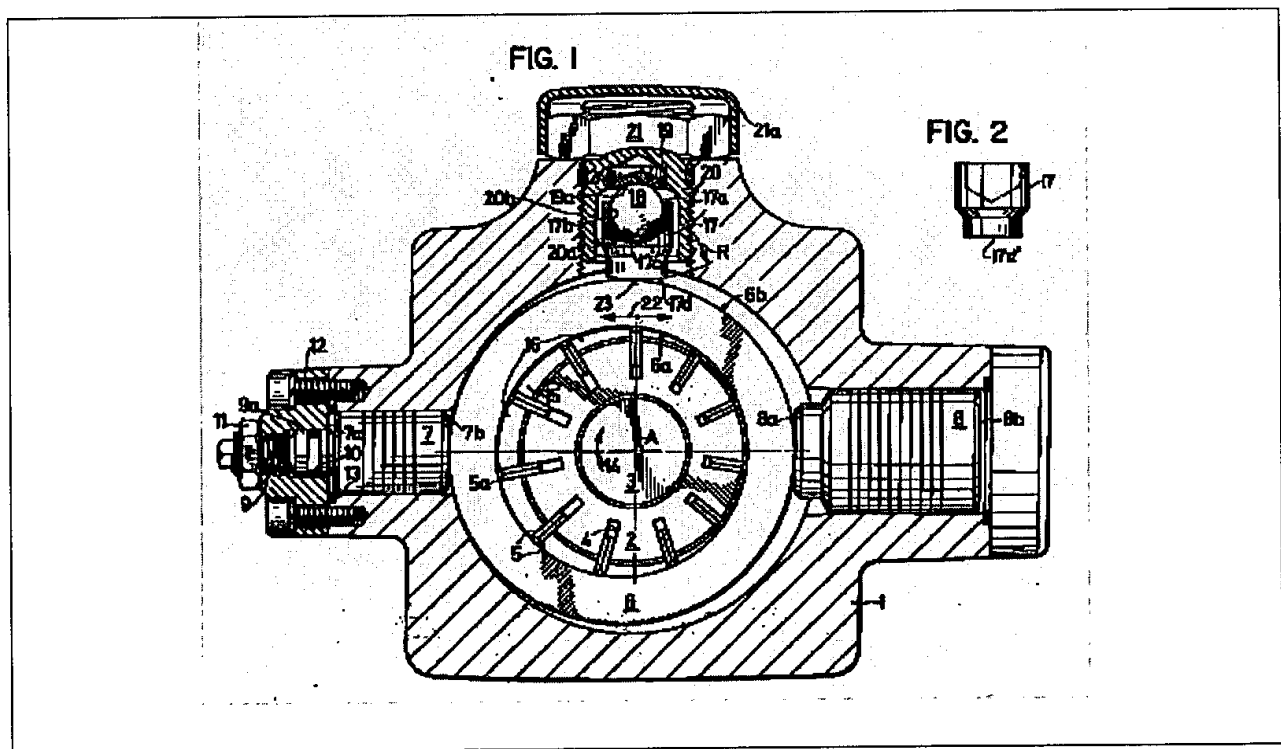


Sundberg, Figures 1-3, in particular Figures 1 & 2 as immediately displayed above disclose a variable displacement vane pump (11), comprising: a housing (20)

defining a chamber, a pump inlet {not reference signed} through which fluid enters the housing (20) and a pump outlet {not reference signed} through which fluid is discharged from the housing (20) under pressure; a containment ring or eccentric ring (14) pivotally (18) carried by the housing (20) for movement between a first position and a second position and defining an opening {not reference signed} with an internal surface (14a); a rotor (12) carried by the housing (20) for rotation relative to the internal surface (14a) and to having a plurality of slots (17) extending inwardly into the rotor (12) from an exterior of the rotor; a plurality of vanes (13) carried by the rotor with each vane slidably received in a slot (17) in the rotor (12); a first actuator {See Fig. 2 right-hand piston touching (44)} responsive to application of fluid under pressure in a first actuation pressure signal and operable to pivot the containment ring or eccentric ring (14) in a first direction; and a second actuator {See Fig. 2 left-hand piston touching (44)} responsive to application of fluid under pressure in a second actuation pressure signal and operable to pivot the containment ring or eccentric ring (14) in a second direction. The first actuator {See Fig. 2 right-hand piston touching (44)} is a piston slidably carried by the body (20) and responsive to a first actuation pressure signal and the said second direction {See Fig. 2 at (44)} is in a direction opposite of the first direction. The pump (11) also comprises a seal {(33), (34)} between the containment ring or eccentric ring (14) and the housing defining a fluid chamber between the housing {(15), (16), (20)} and containment ring or eccentric ring (14) with fluid under pressure in the fluid chamber defining the first actuator. The slots (17) in the rotor (12) extend radially inwardly on

the rotor (12). The seal {(33), (34)} is carried on the housing {(15), (16), (20)}. The said first and second actuators are fluid acting directly {on the stem handle} on said containment ring (14). See Sundberg, Figures 1-3, and respective portions, abstract, col. 3 lines 60-67, col. 4 lines 1-67, col. 5 lines 1-56, of the detailed description.

12. Claims 62-65, 70 & 75 are rejected under 35 U.S.C. 102(b) as being anticipated by (3,918,855) to Bornholdt.

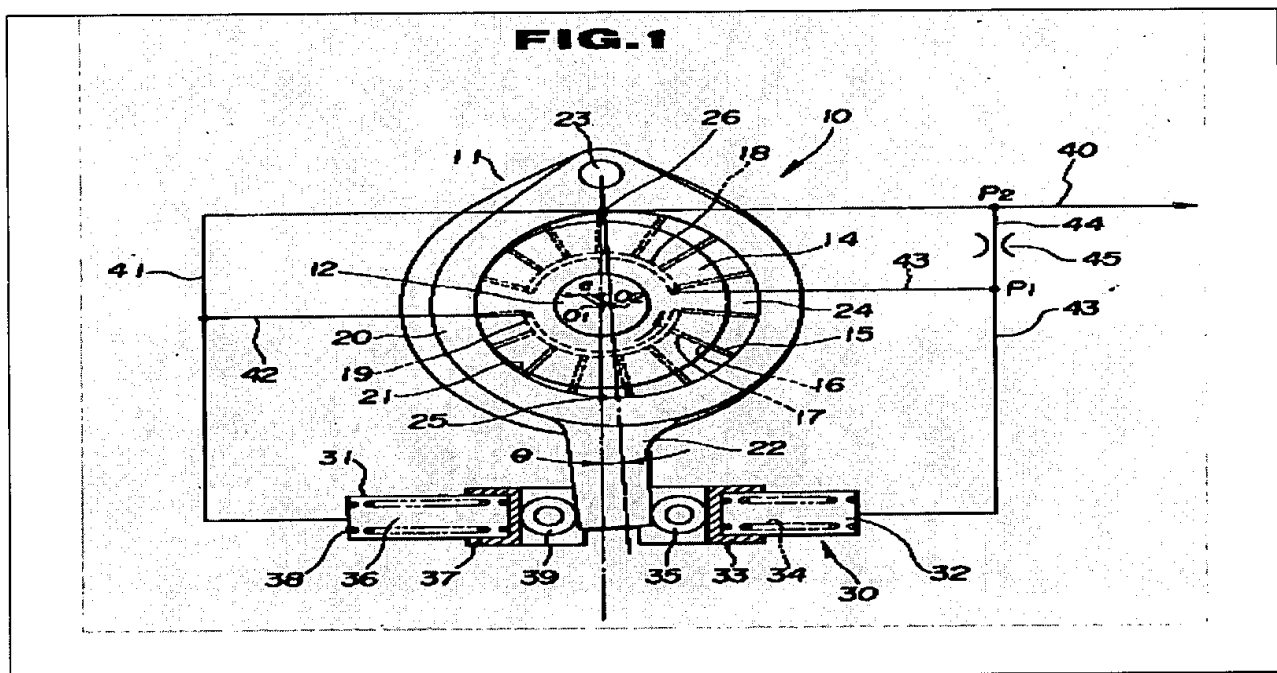


Bornholdt, Figure 1 as immediately displayed above discloses a variable displacement vane pump, comprising: a housing (1) defining a chamber, a pump inlet {not reference signed in (1)} through which fluid enters the housing and a pump outlet

{not reference signed in (1)} through which fluid is discharged from the housing under pressure; a containment ring or eccentric ring (6) pivotally (18) carried by the housing (1) for movement between a first position and a second position and defining an opening {not reference signed} with an internal surface (6a); a rotor (2) carried by the housing (1) for rotation relative to the internal surface (6a) and to having a plurality of slots (4) extending inwardly into the rotor (2) from an exterior of the rotor; a plurality of vanes (5) carried by the rotor (2) with each vane (5) slidably received in a slot (4) in the rotor; a first actuator {(7) or (8)} responsive to application of fluid under pressure in a first actuation pressure signal and operable to pivot (18) the containment ring or eccentric ring (6) in a first direction; and a second actuator {(8) or (7)} responsive to application of fluid under pressure in a second actuation pressure signal and operable to pivot the containment ring or eccentric ring (6) in a second direction. The first actuator {(7) or (8)} is a piston slidably carried by the body and responsive to a first actuation pressure signal. The said second direction is in a direction opposite of the first direction. The slots (4) in the rotor (2) extend radially inwardly on the rotor (2). The vanes (5) have leading and trailing faces and the slots (4) in the rotor (2) are slightly wider than the vanes (5) {vanes slide in slots - not an interference fit} so that a fluid film forms {especially after vane wear} between the rotor (2) and the leading and trailing faces of each vane (5). Especially after vane (5) wear against slot (4) a fluid seal is formed by contact between the vane (5) and rotor (2). The said first and second actuators {(7) & (8)} are fluidly acting directly on said containment ring (14). See

Bornholdt, Figure 1, and respective portions, abstract, col. 3 lines 30-68, col. 4 lines 1-68, col. 5 lines 1-34, of the detailed description.

13. Claims 62-66, 69, 70 & 75 are rejected under 35 U.S.C. 102(b) as being anticipated by (5,141,418) to Ohtaki et al.



Ohtaki et al., Figures 1-7, in particular Figure 1 as immediately displayed above disclose a variable displacement vane pump (10), comprising: a housing {(11a), (11b)} defining a chamber (24), a pump inlet {not reference signed} through which fluid enters the housing {(11a), (11b)} and a pump outlet (40) through which fluid is discharged from the housing (11) under pressure; a containment ring or eccentric ring (20) pivotally (23) carried by the housing (11) for movement between a first position

and a second position and defining an opening {not reference signed} with an internal surface (21); a rotor (14) carried by the housing {(11a), (11b)} for rotation relative to the internal surface (21) and to having a plurality of slots {(16), (17)} extending inwardly into the rotor (14) from an exterior of the rotor; a plurality of vanes (15) carried by the rotor (14) with each vane slidably received in a slot {(16), (17)} in the rotor (14); a first actuator {Right-hand piston (33) touching (22)} responsive to application of fluid under pressure and operable to pivot the containment ring or eccentric ring (20) in a first direction; and a second actuator {Left -hand piston (37) touching (22)} responsive to application of fluid under pressure and operable to pivot the containment ring or eccentric ring (20) in a second direction. The first actuator {Right-hand piston (33) touching (22)} is a piston slidably carried by the body (11) and responsive to a first actuation pressure signal {in (43)} and the said second direction {See (22)} is in a direction opposite of the first direction. The second actuator is a piston (37) slidably carried by the body (11) and responsive to a second actuation pressure signal {in (41)}. The first actuator {Right-hand piston (33) touching (22)} includes a spring (34) that in yielding biases the containment ring or eccentric ring (22) in said first direction. The pump (11) comprises a pivot pin (23) about which the containment ring or eccentric ring (20) pivots, said pivot pin (23) defining a pivot axis of the containment ring or eccentric ring (20) which is offset from the axis of the rotor by about one-half the maximum eccentricity of the containment ring or eccentric ring (20) relative to the rotor (14). The slots in the rotor {(16), (17)} extend radially inwardly on the rotor (14).

The said first and second actuators are fluid acting directly (22) on said containment ring {(20), (22)}. A {passive} control {restricting} valve (45) is responsive to a first fluid pressure signal {in (41) and a second fluid pressure signal {in (43)}. See Ohtaki et al, Figures 1-7, and respective portions, abstract, col. 2 lines 35-68, cols. 3 & 4 lines 1-68, of the detailed description.

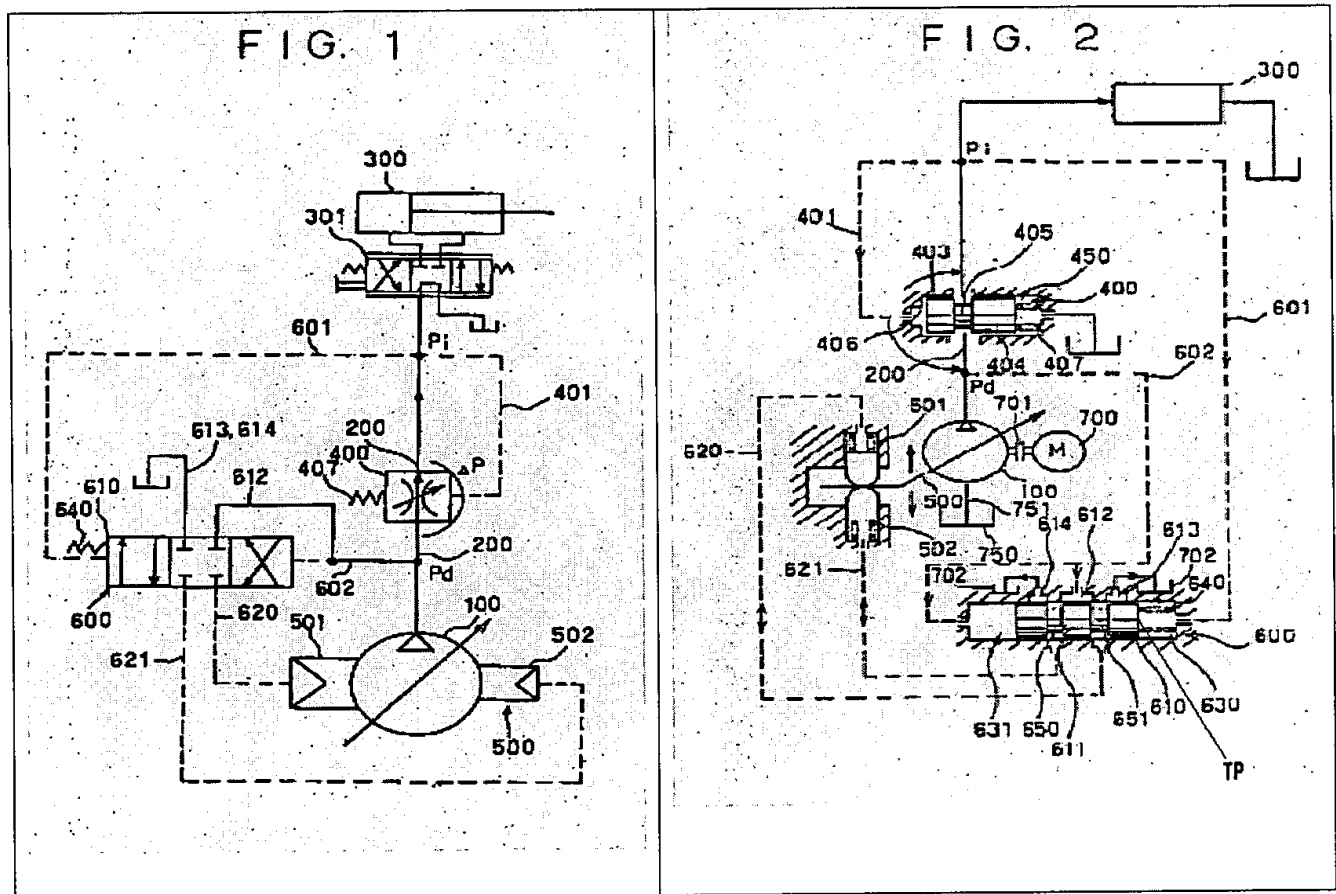
### ***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 1-4, 6, 9, 10, 15, 22, 27, 32, 62-66, 69, 70, 75, 87, 88 & 94 are rejected under 35 U.S.C. 103(a) as being unpatentable over (4,710,106) to Iwata et al. and further in

view of (5,141,418) to Ohtaki et al. as applied to claims 62-66, 69, 70 & 75 in paragraph 13 above.



Iwata et al. Figures 1 & 2 as immediately displayed above disclose a variable displacement pump (100) containing a first actuator (501) responsive to application of fluid pressure {in (620)} and a second actuator responsive (502) responsive to application of fluid under pressure {in (621)} wherein control and positioning of the first (501) and second actuators (502) are a function of a first feedback {fluid, pressure} signal (Pd) and a second feedback {fluid, pressure} signal (Pi) taken from discrete locations

separated by a degree of inherent hydraulic resistance in a downstream fluid circuit {in line (200)}. Iwata et al. also discloses a compression spring (640) connected to a first end (601) of the flow control valve (600). The second end of the spring (604) is connected to a target piston (TP).

Iwata et al. does not disclose the variable displacement pump to be a rotary vane pump. See Iwata et al. Figures 1-5 and respective portions, abstract, and remaining disclosure.

As set forth above in the rejection of claims 62-66, 69, 70 & 75, Ohtaki et al. discloses the rotary vane pump as claimed. See Ohtaki et al, Figures 1-7, and respective portions, abstract, col. 2 lines 35-68, cols. 3 & 4 lines 1-68, of the detailed description.

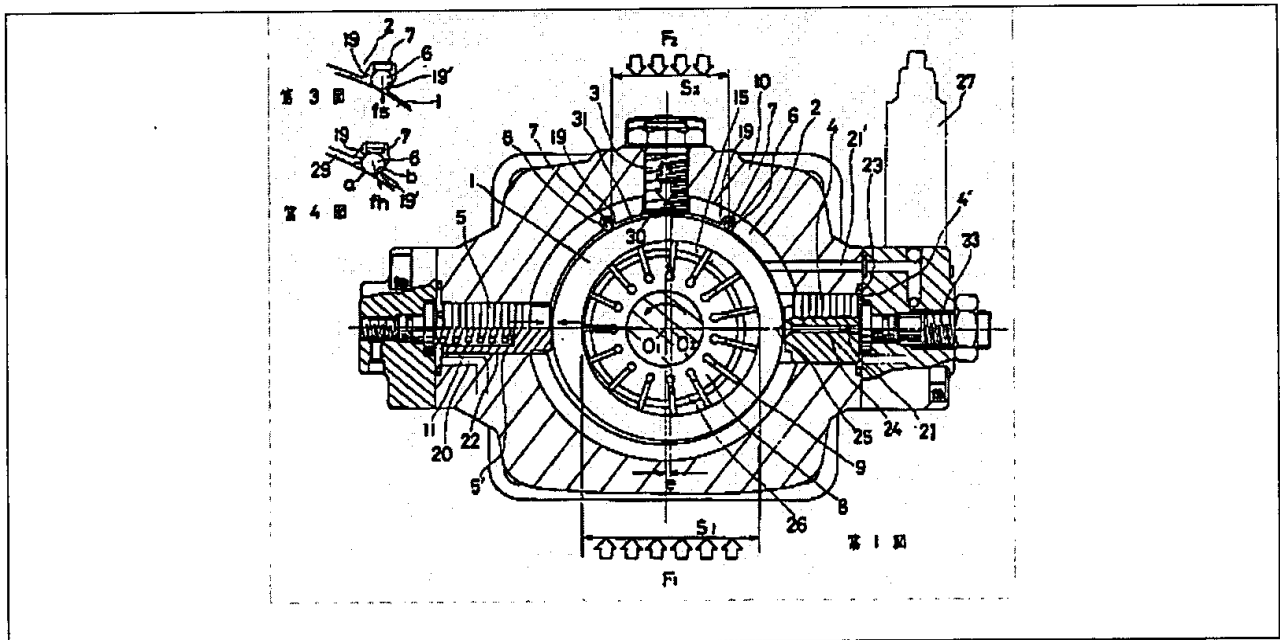
It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to take the invention of Iwata et al. and modify it to use the rotary vane pump of Ohtaki et al. so as to use a rotary vane pump instead of the more expensive rotary cylinder pump of Iwata et al.

16. **Claims 1, 7, 8, 16, 18, 19, 33, 62-69, 76, 78, 87, 88 & 94** are rejected under 35 U.S.C. 103(a) as being unpatentable over (4,710,106) to Iwata et al., and further in view of (JP362294790A) to Takagi et al.

Iwata et al. Figures 1 & 2 disclose a variable displacement pump (100) containing a first actuator (501) responsive to application of fluid pressure {in (620)} and a second

actuator responsive (502) responsive to application of fluid under pressure {in (621)} wherein control and positioning of the first (501) and second actuators (502) are a function of a first feedback {fluid, pressure} signal ( $P_d$ ) and a second feedback {fluid, pressure} signal ( $P_i$ ) taken from discrete locations separated by a degree of inherent hydraulic resistance in a downstream fluid circuit {in line (200)}. Iwata et al. also discloses a compression spring (640) connected to a first end (601) of the flow control valve (600). The second end of the spring (604) is connected to a target piston (TP).

Iwata et al. does not disclose the variable displacement pump to be a rotary vane pump. See Iwata et al. Figures 1-5 and respective portions, abstract, and remaining disclosure.



Takagi et al. Figures 1, 3 & 4 as immediately displayed above disclose a rotary vane pump with first fluid actuator (4) and second fluid actuator (5) with seal(s) (6),

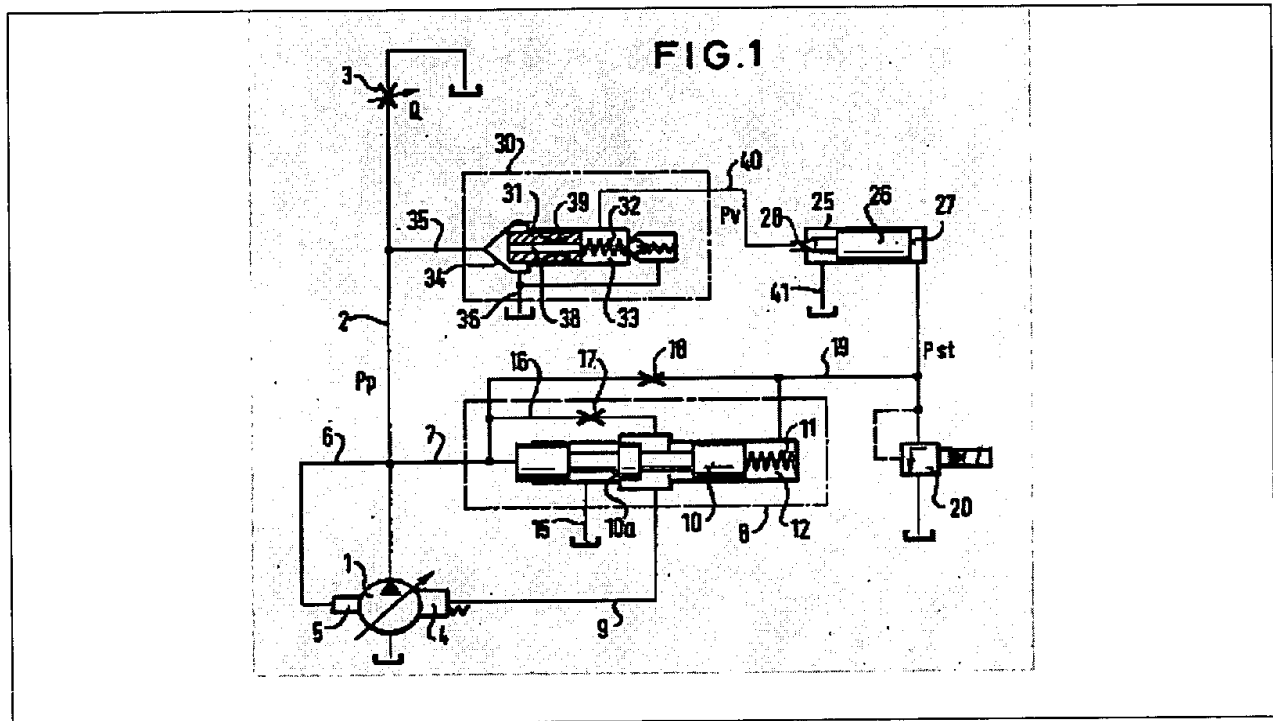
rotor (8), vanes (9). First and second fluid chambers defined between first and second fluid actuators and seals (6). See Takagi et al. Figures 1-4 and English abstract.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to take the invention of Iwata et al. and modify it to use the rotary vane pump of Takagi et al. so as to use a rotary vane pump instead of the more expensive rotary cylinder pump of Iwata et al.

17. **Claim 30 & 31** is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata et al. in view of Ohtaki et al. as applied to claims 1-6, 9, 10, 15, 22, 27, 32, 62-66, 69, 70, 75, 87, 88 & 94 in paragraph 15 above, and further in view of (4,468,173) to Dantlgraber.

As set forth above in the rejections of claims 1-6, 9, 10, 15, 22, 27, 32, 62-66, 69, 70, 75, 87, 88 & 94 Iwata et al. in view of Ohtaki et al. discloses the invention substantially as claimed.

Iwata et al. in view of Ohtaki et al. discloses using the fluid circuit in the automotive applications but does not disclose using the fluid circuit responsive to engine conditions.



Dantlgraber, Figures 1 as immediately displayed above discloses a pressure control valve (8) responsive to a first pilot pressure {via (19)} to control application of said first fluid pressure to said first actuator (4), and responsive to a second pilot pressure {via (7) & (16)} to control application of said second fluid pressure to said second actuator (5). Dantlgraber also discloses a control circuit that can be responsive to engine conditions {Load (3)} for providing a variable targeting of pump output {abstract - low and high pressure ranges of a variable displacement pump} wherein pressure from the oil circuit in the engine {Load (3)} acts on the first actuator (4) and pressure from the outlet acts {via (6)} on the second actuator (5) for variable control of the eccentric ring {in (1)} in response to these conditions. The pump comprises an

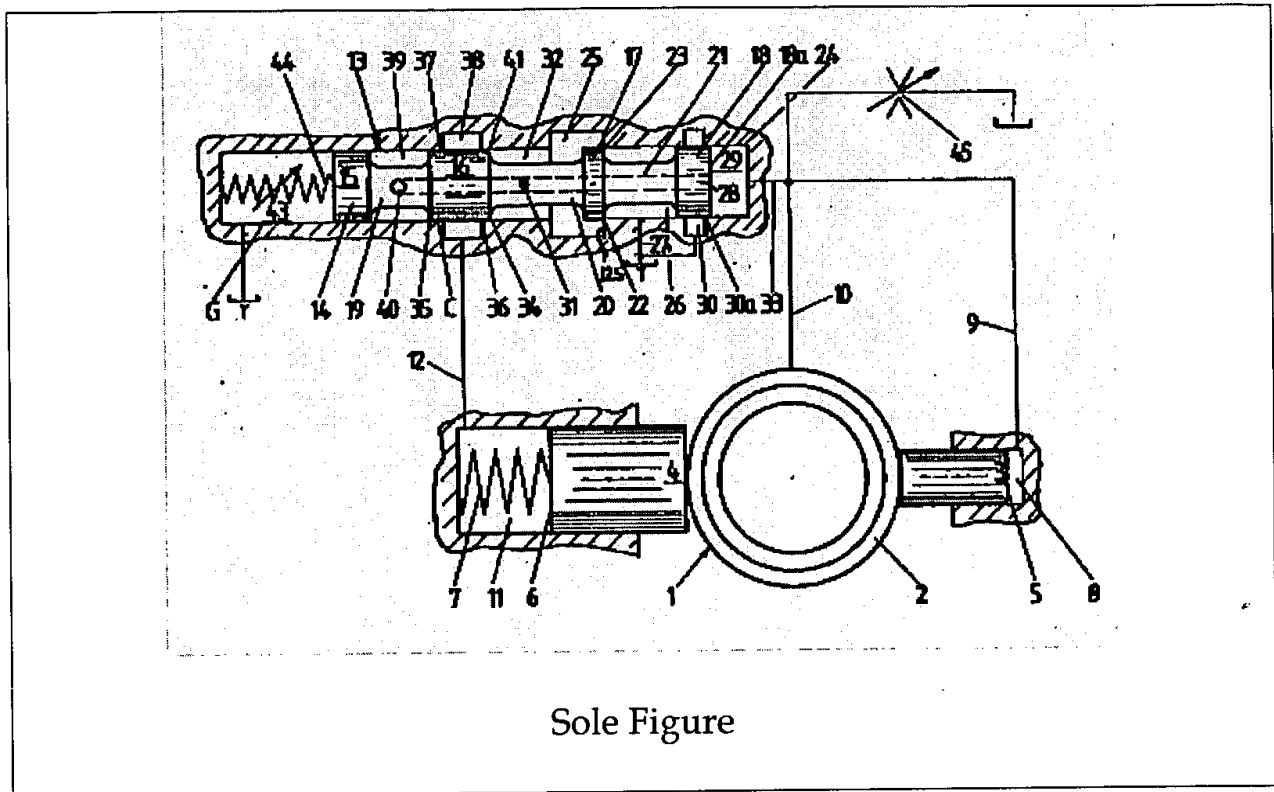
exhaust {discharge} opening {connected to (2)}. See Dantlgraber, Figures 1-3, and respective portions, abstract, col. 2 lines 40-68, col. 3 lines 1-68, col. 4 lines 1-28, of the detailed description.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to take the invention of Iwata et al. in view of Ohtaki et al. and modify it according to Dantlgraber and set the control circuit responsive to engine conditions {loads} so as to use the invention to supply oil to the engine for lubrication.

18. **Claim 30 & 31** is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata et al. in view of Ohtaki et al. as applied to claims 1-6, 9, 10, 15, 22, 27, 32, 62-66, 69, 70, 75, 87, 88 & 94 in paragraph 15 above, and further in view of (5,052,896) to Fischer et al.

As set forth above in the rejections of claims 1-6, 9, 10, 15, 22, 27, 32, 62-66, 69, 70, 75, 87, 88 & 94 Iwata et al. in view of Ohtaki et al. discloses the invention substantially as claimed.

Iwata et al. in view of Ohtaki et al. discloses using the fluid circuit in the automotive applications but does not disclose using the fluid circuit responsive to engine conditions.



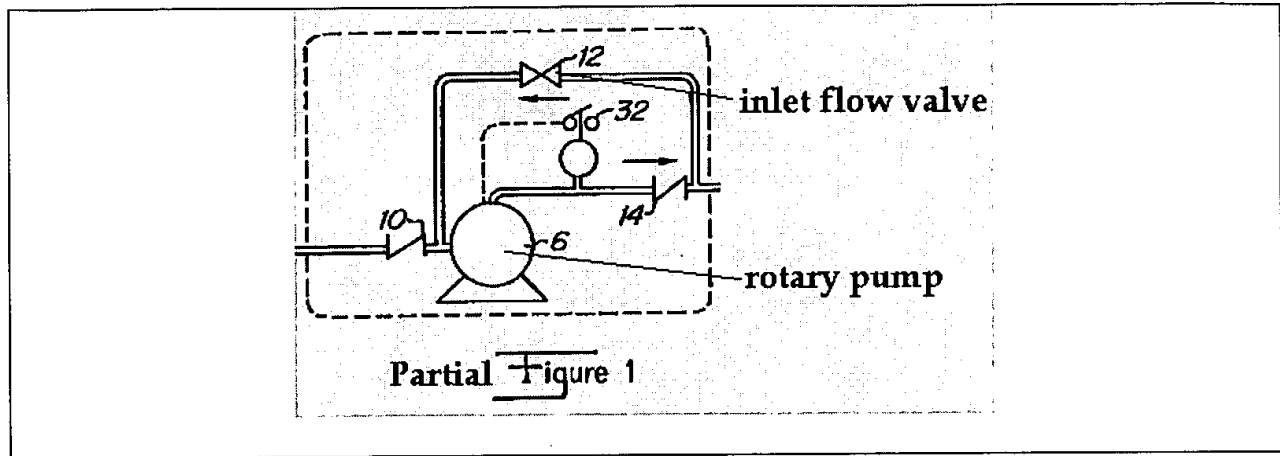
Fischer et al., sole Figure as immediately displayed above discloses a pressure control valve (13) responsive to a first pilot pressure {via (33)} to control application of said first fluid pressure to said first actuator (4), and responsive to a second pilot pressure {via (12)} to control application of said second fluid pressure to said second actuator (3). Fisher et al. also discloses a control circuit that can be responsive to engine conditions {Load (45)} for providing a variable targeting of pump output {abstract - adjustment means for changing the output volume of fluid pump} wherein pressure from the oil circuit in the engine {Load (45)} acts on the first actuator (4) and pressure from the outlet acts {via (9)} on the second actuator (3) for variable control of the

eccentric ring (2) in response to these conditions. The pump comprises an exhaust {discharge} opening {connected to (10)}. See Fischer et al., sole Figure, and respective portions, abstract, col. 3 lines 15-68, cols. 4 & 5 lines 1-68, col. 6 lines 1-6, of the detailed description.

It would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to take the invention of Iwata et al. in view of Ohtaki et al. and modify it according to Fischer et al. and set the control circuit responsive to engine conditions {loads} so as to use the invention to supply oil to the engine for lubrication.

19. **Claims 11 & 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over (4,710,106) to Iwata et al. in view of (5,141,418) to Ohtaki et al. as applied to claims 1-4, 6, 9, 10, 15, 22, 27, 32, 62-66, 69, 70, 75, 87, 88 & 94 in paragraph 15 above, and further in view of (4,850,269) to Hancock et al.

As set forth above in the rejection of claims 1-4, 6, 9, 10, 15, 22, 27, 32, 62-66, 69, 70, 75, 87, 88 & 94 Iwata et al. in view of Ohtaki et al. discloses the invention substantially as claimed. Iwata et al. in view of Ohtaki et al. does not disclose an inlet flow valve.



Hancock et al. Partial Figure 1 as immediately displayed above discloses an inlet flow valve (12) which is spring loaded biased to a position preventing fluid discharge from the pump outlet to flow into the inlet of the pump and responds to a threshold fluid pressure in the discharge line to allow fluid from the pump discharge outlet to flow into the pump inlet. See Hancock et al. Figure 1 and respective portion col. 6 lines 5-28 of the detailed description.

It would have been obvious at the time the invention was made to take the invention of Iwata et al in view of Ohtaki et al. and place an inlet flow valve between (Pd) and line (751) so as to provide self-priming to rotary pump (100) so as to provide cavitation and rotor burn-out.

**\*\*The claims were examined with the broadest reasonable interpretation of the claimed structural/functional subject matter. A proper and acceptable response to this office action requires addressing all issues/objections/rejections invoked in this office action.\*\***

*Allowable Subject Matter*

20. Claims 13, 14, 17, 20, 21, 23-26, 34-42, 71-74, 77, 79-86, 89-93 & 95-97 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21. Claims 28, 29, 43-61 are allowed.

*Response to Arguments*

22. Applicant's arguments with respect to claims 1-4, 6, 7, 9, 10, 15, 16, 18, 21-24, 27 & 30-32 have been considered but are moot in view of the new ground(s) of rejection.

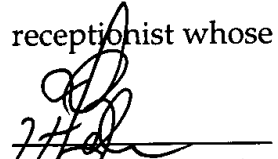
*Conclusion*


23. Any inquiry concerning this communication from the examiner should be directed to **John F. Belena, Ph.D.** whose telephone number is (703) 305-3533. The examiner can normally be reached on Monday through Thursday from 9:00 AM to 5:00 PM. The examiner can also be reached on alternate Fridays from 9:00 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Justine R. Yu, can be reached on (703) 308-2675. The fax number for this

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Group Art Unit 3746 is (703) 872-9302. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group Art Unit 3746 receptionist whose telephone number is (703) 308-0861.

  
JOHN F. BELENA  
2/5/04

  
JUSTINE YU  
SUPERVISORY PATENT EXAMINER  
2/23/04

